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EXAMINER	
GANDHI, DIPAKKUMAR B	
ART UNIT	**PAPER NUMBER**
2133	

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/087,202	ZHANG ET AL.	
	Examiner	Art Unit	
	Dipakkumar Gandhi	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 2, 3, 4, 7, 9, 10, 15, 20, 21, 22, 23, 26, 27, 28, 33, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Decker et al. (US 4,980,897) in view of Patel (US 4,201,976).

As per claim 1, Decker et al. teach multi-channel data transmission through the communication medium (col. 2, lines 51-53, Decker et al.).

However Decker et al. do not explicitly teach the specific use of a method for providing redundancy comprising: selecting a portion of original data from each of a plurality of original channels; performing at least one encoding operation using the portions of original data to produce at least one portion of redundancy data; including the portion of redundancy data in at least one redundancy channel; and transmitting the redundancy channel along with said original channels.

Patel in an analogous art teaches an apparatus, which encodes parity checking bits in two redundant channels of each set of a pair of logically independent sets of channels. There is encoded and recorded in the first redundant channel in each set vertical parity checks limited to the data recorded in the channels of its own set, while there is encoded and recorded in the second redundant channel cross-

parity checks taken over all of the channels in both sets in a predetermined positively or negatively sloped channel direction (col. 2, lines 37-46, Patel).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Decker et al.' s patent with the teachings of Patel by including an additional step of using a method for providing redundancy comprising: selecting a portion of original data from each of a plurality of original channels; performing at least one encoding operation using the portions of original data to produce at least one portion of redundancy data; including the portion of redundancy data in at least one redundancy channel; and transmitting the redundancy channel along with said original channels.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that it would provide the opportunity to correct multiple channels in error at the receiver utilizing the information recorded on redundant channels.

- As per claim 2, Decker et al. and Patel teach the additional limitations.

Patel teaches the method wherein said selecting, performing, and including steps are repeated before said transmitting step (figure 2, col. 4, lines 42-50, Patel).

- As per claim 3, Decker et al. and Patel teach the additional limitations.

Patel teaches the method further comprising the step of: while performing said transmitting step, repeating said selecting, performing, and including steps (figure 2, col. 4, lines 42-50, Patel).

- As per claim 4, Decker et al. and Patel teach the additional limitations.

Patel teaches the method wherein the encoding operation corresponds to a parity bit calculation (figure 2, col. 4, lines 30-34, lines 42-50, Patel).

- As per claim 7, Decker et al. and Patel teach the additional limitations.

Patel teaches the method wherein an adaptively controlled level of redundancy is used to perform said encoding operation, said level of redundancy being adaptively controlled according to at least one measure of error-proneness associated with said original channels (abstract, col. 2, lines 64-67, Patel).

- As per claim 9, Decker et al. and Patel teach the additional limitations.

Decker et al. teach multi-channel data transmission (col. 2, lines 51-53, Decker et al.).

Patel teaches a method for correcting error in multi-channel data having redundancy, the method comprising: receiving at least one redundancy channel and a number of original channels belonging to a plurality of original channels, said at least one redundancy channel and said plurality of original channels being transmitted over a communication medium; selecting a portion of redundancy data from said redundancy channel; selecting a portion of original data from each of said number of original channels; and performing at least one decoding operation using said portion of redundancy data and said portions of original data to correct at least one error in said plurality of original channels (col. 9, lines 49-60, Patel).

- As per claim 10, Decker et al. and Patel teach the additional limitations.

Patel teaches the method wherein the step for performing at least one decoding operation comprises the step of: detecting the existence of at least one error (col. 9, lines 34-37, Patel).

- As per claim 15, Decker et al. and Patel teach the additional limitations.

Patel teaches the method wherein the step for performing at least one decoding operation comprises the step of: detecting the location of at least one error (figure 8, col. 18, lines 28-30, Patel).

- As per claim 20, Decker et al. and Patel teach the additional limitations.

Patel teaches the method wherein the step for performing at least one decoding operation further comprises the step of: correcting at least one error (col. 9, lines 53-55, Patel).

- As per claim 21, Decker et al. and Patel teach the additional limitations.

Patel teaches the method wherein the steps for selecting a portion of redundancy data, selecting a portion of original data, and performing at least one decoding operation are repeated after said receiving step (col. 11, lines 4-9, line 13, Patel).

- As per claim 22, Decker et al. and Patel teach the additional limitations.

Patel teaches the method wherein the steps for selecting a portion of redundancy data, selecting a portion of original data, and performing at least one decoding operation are repeated while performing said receiving step (col. 11, lines 4-9, line 13, Patel).

- As per claim 23, Decker et al. and Patel teach the additional limitations.

Patel teaches the method wherein the decoding operation corresponds to a parity bit calculation (col. 2, lines 50-56, Patel).

- As per claim 26, Decker et al. and Patel teach the additional limitations.

Decker et al. teach the method wherein the portions of original data are selected from a common position within their respective original channels (figure 8, col. 7, lines 1-4, Decker et al.).

- As per claim 27, Decker et al. and Patel teach the additional limitations.

Decker et al. teach the method wherein each said portion of original data consists of a bit (figure 1, col. 3, lines 50-57, Decker et al.).

- As per claim 28, Decker et al. and Patel teach the additional limitations.

Decker et al. teach the method wherein each said portion of original data consists of a non-binary symbol (col. 14, lines 38-40, Decker et al.).

- As per claim 33, Decker et al. and Patel teach the additional limitations.

Decker et al. teach multi-channel data transmission (col. 2, lines 51-53, Decker et al.).
Patel teaches a system for providing redundancy comprising: means for selecting a portion of original data from each of a plurality of original channels adapted to transmission over a communication medium; means for performing at least one encoding operation using said portions of original data to produce at least one portion of redundancy data; means for including said portion of redundancy data in at least one redundancy channel; and means for transmitting said redundancy channel along with said original channels in said communication medium (col. 2, lines 37-46, Patel).

- As per claim 34, Decker et al. and Patel teach the additional limitations.

Decker et al. teach multi-channel data transmission (col. 2, lines 51-53, Decker et al.).
Patel teaches a system having redundancy for correcting error, the system comprising: means for receiving at least one redundancy channel and a plurality of original channels transmitted over a communication medium; means for selecting a portion of redundancy data from said redundancy channel; means for selecting a portion of original data from each of said original channels; and means for performing at least one decoding operation using said portion of redundancy data and said portions of original data to correct at least one error in said portions of original data (col. 9, lines 49-60, Patel).

4. Claims 5, 6, 8, 24, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Decker et al. (US 4,980,897) and Patel (US 4,201,976) as applied to claim 1 and 9 above, and further in view of Kumar (US 5,949,796).

As per claim 5, Decker et al. and Patel substantially teach the claimed invention described in claim 1 (as rejected above).

However Decker et al. and Patel do not explicitly teach the specific use of the encoding operation corresponding to a block code.

Kumar in an analogous art teaches block ECC encoding using Reed-Solomon or BCH block codes, for example, because the construction of the codeword has a specific characteristic bit length. For block codes, the codeword length is equal to the characteristic ECC block code length (col. 35, lines 17-22, Kumar).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Decker et al.' s patent with the teachings of Kumar by including an additional step of using the encoding operation corresponding to a block code.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that using the encoding operation corresponding to a block code would provide the opportunity to use an encoder for a block code that maps a k-symbol input sequence into an n-symbol output sequence. Each n-symbol block depends only upon a specific k-symbol block and on no others.

- As per claim 6, Decker et al., Patel and Kumar teach the additional limitations.

Kumar teaches that block code is a Reed-Solomon code (col. 35, lines 17-22, Kumar).

- As per claim 8, Decker et al., Patel and Kumar teach the additional limitations.

Kumar teaches the method wherein said measure of error-proneness is a signal-to-noise ratio (SNR), (col. 12, lines 1-6, Kumar), signal-to-interference ratio (SIR), (col. 62, line 47, Kumar) or bit error rate (BER), (col. 31, lines 5-9, Kumar).

- As per claim 24, Decker et al., Patel and Kumar teach the additional limitations.

Kumar teaches the method wherein the decoding operation corresponds to a block code (col. 50, lines 34-37, col. 67, lines 6-9, Kumar).

- As per claim 25, Decker et al., Patel and Kumar teach the additional limitations.

Kumar teaches the method wherein the block code is a Reed-Solomon code (col. 35, lines 17-22, Kumar).

5. Claims 11, 12, 13, 14, 16, 17, 18, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Decker et al. (US 4,980,897) and Patel (US 4,201,976) as applied to claim 10 and 15 above, and further in view of Kono et al. (US 5,455,536).

As per claim 11, Decker et al. and Patel substantially teach the claimed invention described in claim 10 (as rejected above).

However Decker et al. and Patel do not explicitly teach the specific use of monitoring at least one error-indicating condition during said receiving step.

Kono et al. in an analogous art teach a bit error rate monitor for detecting a bit error rate of the demodulated result of the demodulator (col. 2, lines 10-12, Kono et al.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Decker et al.' s patent with the teachings of Kono et al. by including an additional step of monitoring at least one error-indicating condition during said receiving step.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that monitoring at least one error-indicating condition during said receiving step would provide the opportunity to determine the presence of errors in the data received at the receiver and apply error correction process.

- As per claim 12, Decker et al., Patel and Kono et al. teach the additional limitations.

Kono et al. teach the method wherein said error-indicating condition relates to carrier signal reception (col. 1, lines 10-13, Kono et al.).

- As per claim 13, Decker et al., Patel and Kono et al. teach the additional limitations.

Kono et al. teach the method wherein the error-indicating condition relates to demodulation (col. 2, lines 10-12, Kono et al.).

- As per claim 14, Decker et al., Patel and Kono et al. teach the additional limitations.

Patel teaches the method wherein the error-indicating condition relates to in-channel error correction decoding (col. 9, lines 53-55, Patel).

- As per claim 16, Decker et al., Patel and Kono et al. teach the additional limitations.

Kono et al. teach the method wherein the step for detecting the location of at least one error comprises the step of: monitoring at least one error-indicating condition during said receiving step (col. 2, lines 10-12, Kono et al.).

- As per claim 17, Decker et al., Patel and Kono et al. teach the additional limitations.

Kono et al. teach the method wherein the error-indicating condition relates to carrier signal reception (col. 1, lines 10-13, Kono et al.).

- As per claim 18, Decker et al., Patel and Kono et al. teach the additional limitations.

Kono et al. teach the method wherein said error-indicating condition relates to demodulation (col. 2, lines 10-12, Kono et al.).

- As per claim 19, Decker et al., Patel and Kono et al. teach the additional limitations.

Patel teaches the method wherein the error-indicating condition relates to in-channel error correction decoding (col. 9, lines 53-55, Patel).

6. Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Decker et al. (US 4,980,897) and Patel (US 4,201,976) as applied to claim 9 above, and further in view of Harkness et al. (US 2002/0059633 A1).

As per claim 29, Decker et al. and Patel substantially teach the claimed invention described in claim 9 (as rejected above).

However Decker et al. and Patel do not explicitly teach the specific use of the method wherein said communication medium is cable-based.

Harkness et al. in an analogous art teach that the communication medium 30 may be a public telephone network, air accessed by radiating antennas such as satellite, cellular, and terrestrial antennas, over cables such as the RF return over a cable plant, the Internet, or the like (figure 1, page 3, paragraph 29, Harkness et al.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Decker et al.' s patent with the teachings of Harkness et al. by including an additional step of using the method wherein said communication medium is cable-based.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that using the method wherein said communication medium is cable-based would provide the opportunity to transmit video, audio and data at fast speed using the large bandwidth of cable medium.

- As per claim 30, Decker et al., Patel and Harkness et al. teach the additional limitations.

Harkness et al. teach the method wherein said communication medium is satellite-based (figure 1, page 3, paragraph 29, Harkness et al.).

- As per claim 31, Decker et al., Patel and Harkness et al. teach the additional limitations.

Harkness et al. teach the method wherein said communication medium is terrestrial (figure 1, page 3, paragraph 29, Harkness et al.).

- As per claim 32, Decker et al., Patel and Harkness et al. teach the additional limitations.

Harkness et al. teach the method wherein said original channels contain audio, video, and/or data signals (page 2, paragraph 14, Harkness et al.).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dipakkumar Gandhi whose telephone number is 703-305-7853. The examiner can normally be reached on 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dipakkumar Gandhi
Patent Examiner

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